Key Points
• Climate change will erode the conditions necessary for property insurance to remain available and affordable in many areas across Canada.
• Uncertainty combined with inadequate investment and coordination in Canada’s disaster management systems increase the exposure of the insurance industry to climate change and the potential for decreases in availability and affordability.
• Property insurance markets are not sustainable without coordinated efforts between all levels of government to:
  • increase investments in hazard and climate change risk mitigation;
  • assess and identify areas where the socio-economic implications of insurance shortages will be disproportionate; and
  • improve awareness about the division of responsibility for hazard risk mitigation between insurers, property owners and governments.

The insurance industry and the economic benefits it provides are not sustainable without a concerted effort by Canadian municipal, provincial and federal policy makers to improve hazard and climate change risk management. Unfortunately, decision makers have yet to establish a framework for managing the impact of extreme weather and climate change on property insurance systems.

Insurance generates important economic benefits as it helps loss recovery and incentivizes individuals and communities to reduce risk. For these reasons, insurance has been identified as a critical component in managing hazard and climate change risks. For example, high insurance prices can help governments identify areas where investment in structural defenses (for example, dykes to prevent flooding), restrictions on further development and informing property owners about risk can substantially reduce socio-economic vulnerability to hazards. There is a growing concern, however, that the increasing frequency and magnitude of extreme weather generated by climate change is limiting the conditions necessary for insurance availability and affordability (Kunreuther, Michel-Kerjan and Ranger 2013; Cutter et al. 2012). These events also threaten the solvency of insurers without adequate reserves to cover for large disasters.

How can policy makers sustain and leverage insurance markets as a climate change risk regime? This policy brief describes the background for the role of insurance in governing hazards and climate change, describes challenges facing the insurance system and presents several policy recommendations aimed at sustaining and maximizing the insurance system and its benefits.

Background
Over the last 30 years, insurance markets have experienced an unprecedented increase in payouts generated by extreme weather and natural disasters. Insured losses in Canada have been growing since the early 1980s with a record CDN$3.2 billion in claims in 2013 (Insurance Bureau of Canada 2014). This trend is not
The United States has adopted a state-level regulatory framework, and the most part, responsible for developing these rules. In addition to the holder's ability to pay. National insurance regulators are, for the markets to ensure that the costs of coverage do not exceed a policy in-200-years loss event. Premiums are also regulated in some requires that insurers have enough capital to withstand a once-

For example, the European Union's Solvency II regulation establishing a minimum amount of capital that is necessary to regulations focus on ensuring the industry remains solvent by

More specifically, insurance serves as a source of risk governance and the benefits of investment in adaptation.

The insurance industry is a highly regulated sector. Most of these regulations focus on ensuring the industry remains solvent by establishing a minimum amount of capital that is necessary to cover significant liabilities, such as losses from a natural disaster. For example, the European Union's Solvency II regulation requires that insurers have enough capital to withstand a once-in-200-years loss event. Premiums are also regulated in some markets to ensure that the costs of coverage do not exceed a policy holder's ability to pay. National insurance regulators are, for the most part, responsible for developing these rules.\(^1\) In addition to financial regulation, infrastructure, disaster management and land-use policy also have a significant influence on the insurance sector. Inadequate investment in infrastructure and poor building codes, along with disaster relief spending and land use that encourages (re)settlement in high-risk areas, can expose the insurance industry to significant losses that lead to shortages in coverage.

Climate change impacts on insurance have started to gain attention among some governments and regulatory authorities. The Bank of England, for example, recently requested that UK insurers disclose how climate change will affect their business. US and Canadian regulators have adopted a similar approach in recent years, seeking improvements in similar disclosure. As the US survey revealed, however, “most P&C [property & casualty] insurers are paying inadequate attention to climate change risks” (Ceres 2014, 7). Furthermore, policy makers have yet to adequately address the challenges that can limit the availability and affordability of insurance and the strategies necessary to maximize its benefits as a climate change risk regime.

**Insurability and Climate Change**

**Uncertainty**

Insurers and property owners lack the information necessary to make informed decisions about risk mitigation strategies. Insurance pricing is based on historical data on the frequency and probability of natural events that cause damage. This approach is akin to “driving down the road by looking at the rearview mirror,” given the potential impacts of climate change. Future projections of climate change must be incorporated into insurance decision making to improve the accuracy of pricing. Most projections are, however, limited in their capacity to inform insurance as they lack the local resolution to identify how risks could change at the property-lot level. Property owners also face uncertainty generated by insufficient information about their own risk exposure to climate change. For example, in Canada, most flood plain maps that identify locations where flooding is more likely to occur are outdated or unavailable to property owners (MMM Group 2014). As a consequence, most insurance policy holders are unaware of the risks they face. This can lead to a moral hazard whereby property owners limit their actions to reduce vulnerability because they assume insurance will cover damage. Insurers face a similar asymmetry whereby premiums do not reflect the actual exposure to risk and reserves are insufficient to cover a significant loss event.

Inadequate information on risk exposure creates unnecessary confusion among property owners, insurers and governments over who is responsible for reducing vulnerability. This confusion generates reputational and political risks for both

---

1 The United States has adopted a state-level regulatory framework, and the European Union is now moving to a regional approach where rules are harmonized.
insurers and governments. For example, in the aftermath of the Alberta flooding in 2013, many homeowners were unaware that their property insurance did not cover overland flood damage (current insurance policies cover only sewer backup damage). This gap in coverage generated significant reputational risk for insurers. Complaints from property owners who did not quality for coverage convinced the Alberta government to intervene and pressure insurers into offering payouts regardless of their contractual obligation. More broadly, political pressure also forced the Alberta and federal governments to offer disaster recovery assistance to property owners who rebuilt in the flood plain. This approach leads to a moral hazard whereby property owners are discouraged from investing in actions that reduce risk, based on a perception that the government will act as an “insurer-of-last-resort.”

To reduce climate change vulnerability, insurers must adjust their premium prices to reflect different risk exposures. Concern that these adjustments could increase reputational risk inhibits insurers from assessing the market rate of risk, which ends up subsidizing individuals living in high-risk areas. These pressures limit the incentive for the insurance industry to invest in the research and risk communication necessary to accurately assess risk, and reduce their policy holders’ vulnerability to extreme events.

**Hazard and Disaster Risk Mitigation Deficit**

Canadian disaster and hazard risk policy is insufficient for sustaining property insurance availability and has yet to assess the impacts of climate change on insurability. Most of these policies are reactive and focus on recovery through the provision of financial assistance to help property owners rebuild in the aftermath of damage. Proactive measures, such as investments in structural defenses, land-use restrictions or building code updates that improve resiliency for future loss events, are rarely prioritized due to a perception that the upfront costs are too expensive. As a consequence, Canadian communities face a hazard risk mitigation deficit generated by inadequate funding in the preparation necessary to reduce vulnerability.

In January 2015, Public Safety Canada (PSC) announced that it will invest CDN$200 million to “modernize” hazard risk reduction through a new National Disaster Mitigation Program that supports “shifting from a reactive model to one that allows us to better identify, plan for, and prevent flood risks and the cost for Canadians that comes with them” (PSC 2015). This investment is long overdue, but it is relatively small when compared to recent international standards. Whereas PSC has committed CDN$200 million (CDN$6 per capita) over five years, the UK government has invested CDN$4.2 billion (CDN$49 per capita) in flood risk reduction over six years (DEFRA 2014; PSC 2015). In addition to inadequate investment, the program also fails to address problems generated by the existing fragmented policy approach.

Whereas municipalities are exposed to most of the costs associated with extreme weather, they lack the authority to raise sufficient funds for strengthening critical infrastructure and make land-use decisions that limit future vulnerability. To access financing for infrastructure improvements, municipalities must apply to Infrastructure Canada’s Build Canada program. Allocation of funding tends to bias short-term political interests, such as highly visible buildings, rather than critical infrastructure, such as storm sewer systems or flood dykes. In addition, there is a disconnect between decision making over infrastructure and disaster risk mitigation, which is the responsibility of PSC. Under the new mitigation program, municipalities are encouraged to apply for funding that reduces vulnerability to hazards, but the program does not establish a formal requirement.

Provinces are responsible for developing, through the planning act, land-use planning frameworks that reflect science on hazard exposure and help communicate risks to property owners and developers. For example, flood plain mapping generates the boundaries that municipalities use to identify areas where development is not vulnerable to flooding. Unfortunately, the federal government cancelled the Flood Disaster Reduction Program in the late 1990s, a program that helped finance provincial mapping strategies. As a consequence, most maps are outdated, have yet to be digitized and lack information on how climate change is likely to influence hazard vulnerability. In addition, the implementation and enforcement of land-use planning frameworks is governed by municipalities, which face significant pressure to allow development in high-risk areas as a means of generating tax revenue to sustain existing infrastructure. Planning bodies, such as the Ontario Municipal Board, which provide third-party oversight to planning decisions, remain absent from engaging in municipal decisions that could increase hazard exposure.

**Policy Recommendations**

**Address Canada’s Disaster and Hazard Risk Mitigation Deficit**

First, investment in PSC’s new National Disaster Mitigation Program must be increased, as current funding is relatively small when compared to international standards. Second, the new program must adopt a shared governance model with coordinated communication and roles among local, provincial and federal authorities to help reduce fragmentation in Canada’s existing approach. For example, updated flood maps should be developed using a standardized approach coordinated by the federal government, adopted by provinces in their land-use frameworks, including decision making by third-party planning organizations, and communicated to property owners living in high-risk areas. Third, a portion of Infrastructure
Canada’s Build Canada fund should be designated for risk reduction projects.

**Establish the Socio-economic Case for Sustainable Insurance**

The insurance industry needs to work with the research community to identify areas where socio-economic vulnerability is likely to increase as a consequence of insurance shortages caused by climate change risk. A first step involves research that identifies how insurance coverage and prices are likely to change under different climate change scenarios. Canada’s disaster risk mitigation program currently lacks information on changing insurability. This is unfortunate as municipalities and provinces could use this information as an economic justification to invest in measures that can reduce vulnerability, such as structural defenses, land-use restrictions and risk awareness. It is often difficult to justify such an investment, given the high up-front costs and uncertainty over a return. Information on insurability can help inform a socio-economic case for improvements in resiliency that ensure Canadians are prepared for extreme weather, but also sustain the important benefits of insurance.

**Improve Collaboration and Communication between the Insurance Industry and the Federal Government on Disaster Risk Reduction**

The insurance industry and federal government need to facilitate a broad-based discussion on the division of responsibility for disaster risk. Property owners, municipalities, provincial governments, the federal government and the insurance industry all play important roles in protecting Canadians from the harm of extreme weather and natural hazards. The responsibilities of each of these stakeholders in promoting risk mitigation are unclear under the current system. Without a clear division of responsibility for disaster risk management, information asymmetries will continue to cause confusion that creates reputational risk for insurers and governments. Current discussions within the insurance industry on the potential introduction of overland flood insurance provide an opportunity to clearly delineate these responsibilities. If overland flood insurance does emerge, the federal government will no longer be responsible for disaster assistance for property owners who purchase coverage and suffer flooding. But to encourage property owners to invest in risk mitigation, all levels of government must become much more proactive in their risk communication and assessment.

**Conclusion**

Canadian communities are not adequately prepared for existing and future hazards generated by climate change. A key component of reducing such vulnerability is ensuring that property insurance remains available and affordable. This challenge has yet to be formally addressed by Canadian decision makers at all levels of government. Uncertainties over the impacts of climate change on insurance and inadequate investment in hazard risk reduction policy increase the costs of providing coverage in Canada. This is unfortunate as insurance is a critical economic resource for Canadians: it is necessary to qualify for a mortgage or start a business, helps individuals and businesses to recover in the aftermath of property damage, and helps to educate about exposure to risk. To sustain these benefits, it is critical that governments and insurers coordinate to increase investment in risk mitigation policy, identify areas where insurance shortages could increase socio-economic vulnerability and discuss how climate change and hazard risks should be governed.
**Works Cited**


---

**About the Author**

Jason Thistlethwaite is a CIGI fellow, as well as assistant professor in the School of Environment, Enterprise and Development in the Faculty of Environment at the University of Waterloo. At CIGI, Jason's research focuses on the implications of the new environmental and climate change risks disclosure regime on the financial sector, and on recommendations to help align policy and industry’s resources toward an effective approach to mitigate climate change. To inform this research, Jason works directly with business and government leaders in the insurance, banking, real estate, building and investment industries. His research has been published in a number of academic and industry journals, and he is a frequent speaker and media contributor on Canada’s growing vulnerability to extreme weather. Jason holds a Ph.D. in global governance from the Balsillie School of International Affairs.
These papers are an output of a project that aims to promote policy and institutional innovation in global economic governance in two key areas: governance of international monetary and financial relations and international collaboration in financial regulation. With authors from eight countries, the 11 papers in this series will add to existing knowledge and offer original recommendations for international policy cooperation and institutional innovation.

**Changing Global Financial Governance:**
International Financial Standards and Emerging Economies since the Global Financial Crisis
Hyoung-kyu Chey

**Internationalization of the Renminbi:**
Developments, Problems and Influences
Ming Zhang

**Capital Flows and Capital Account Management in Selected Asian Economies**
Rajeswari Sengupta and Abhijit Sen Gupta

**Emerging Countries and Implementation:**
Brazil's Experience with Basel's Regulatory Consistency Assessment Program
Fernanda Martins Bandeira

**The Shadow Banking System of China and International Regulatory Cooperation**
Zheng Liansheng

**Emerging Countries and Basel III:**
Why Is Engagement Still Low?
Andrew Walter

**Financial Inclusion and Global Regulatory Standards:**
An Empirical Study Across Developing Economies
Mariana Magaldi de Sousa

**International Regulatory Cooperation on the Resolution of Financial Institutions:**
Where Does India Stand?
Renuka Sane

**Capital Flows and Spillovers**
Sebnem Kalemli-Ozcan

**The Global Liquidity Safety Net:**
Institutional Cooperation on Precautionary Facilities and Central Bank Swaps
C. Randall Henning

**Capital Controls and Implications for Surveillance and Coordination:**
Brazil and Latin America
Marcio Garcia

---

**CIGI Special Reports**

**Essays on International Finance: Volume 1 — International Cooperation and Central Banks**
Harold James

The inaugural volume in the series, written by Harold James, discusses the purposes and functions of central banks, how they have changed dramatically over the years and the importance of central bank cooperation in dealing with international crises.

**Essays on International Finance: Volume 2 — Stabilizing International Finance: Can the System Be Saved?**
James M. Boughton

The world economy showed remarkably strong and widespread growth throughout most of the second half of the twentieth century. The continuation of that success, however, has been undercut by financial instability and crisis. Weak and uncoordinated macroeconomic policies, inappropriate exchange rate policies, inherently volatile private markets for international capital flows, and weak regulation and oversight of highly risky investments have all played a part. To regain the financial stability that must underpin a renewal of global economic strength will require improvements in both policy making and the structure of the international financial system.
CIGI Papers

The China (Shanghai) Pilot Free Trade Zone: Backgrounds, Developments and Preliminary Assessment of Initial Impacts
CIGI Papers No. 59
John Whalley

The China (Shanghai) Pilot Free Trade Zone (SPFTZ), founded in September 2013, has promised liberalization on capital account and trade facilitation as its main objectives. This paper discusses reasons why China needs such a pilot zone after three decades of economic development, examines the differences between the SPFTZ and other free trade zones and highlights the developments of the SPFTZ since its inception. The hope is that the success of the SPFTZ will give rise to a more balanced Chinese economy in the following decade.

The Influence of RMB Internationalization on the Chinese Economy
CIGI Papers No. 58
Qiyuan Xu and Fan He

Since China’s pilot scheme for RMB cross-border settlement was launched in 2009, it has become increasingly important for monetary authorities in terms of macroeconomic policy frameworks. The authors use an analytical model that includes monetary supply and demand to examine the influences of RMB cross-border settlement on China’s domestic interest rate, asset price and foreign exchange reserves. They also look at how RMB settlement behaves in different ways with the various items in China’s balance of payments.

The Risk of OTC Derivatives: Canadian Lessons for Europe and the G20
CIGI Papers No. 57
Chiara Oldani

Over-the-counter (OTC) derivatives played an important role in the buildup of systemic risk in financial markets before 2007 and in spreading volatility throughout global financial markets during the crisis. In recognition of the financial and economic benefits of derivatives products, the G20 moved to regulate the use of OTC derivatives. Attention has been drawn to the detrimental effects of the United States and the European Union to coordinate OTC reform, but this overlooks an important aspect of the post-crisis process: the exemption of non-financial operators from OTC derivative regulatory requirements.

Sovereign Bond Contract Reform: Implementing the New ICMA Pari Passu and Collective Action Clauses
CIGI Papers No. 56
Gregory D. Makoff and Robert Kahn

The International Capital Market Association (ICMA) has recently published proposed standard terms for new, aggregated collective action clauses. Concurrently, the ICMA released new model wording for the pari passu clause typically included in international sovereign bond contracts. These announcements and the commencement of issuance of bonds with these clauses are an important turning point in the evolution of sovereign bond markets.

Completing the G20’s Program to Reform Global Financial Regulation
CIGI Papers No. 55
Malcolm D. Knight

The measures regulators have largely agreed on for a strengthened and internationally harmonized financial regulatory regime, which were endorsed at the 2014 G20 leaders summit in Brisbane, are a major step toward achieving a robust and less crisis-prone global financial system. There are, however, a number of specific measures that need to receive closer attention in order for the G20 leaders to declare their reform program a success. This paper discusses what policy makers and regulators should focus on in 2015 and why closer international cooperation in implementing regulatory reforms will be essential for success.

The Trade in Services Agreement: Plurilateral Progress or Game-changing Gamble?
CIGI Papers No. 53
Patricia M. Goff

Trade analysis in the current moment is understandably focused on mega-regional negotiations, but plurilateral talks also deserve our attention. Plurilateral negotiations leading to a Trade in Services Agreement (TiSA) is the focus of this paper. Barriers to trade in services are distinct and their removal consequential; thus inviting careful consideration and, ideally, public debate. This paper seeks to illuminate developments in negotiations toward the plurilateral TiSA. Just as it has become commonplace to ask whether regional agreements advance economic and political agendas, so is it useful to explore the promise and peril of plurilateral agreements such as TiSA.

Available as free downloads at www.cigionline.org
About CIGI

The Centre for International Governance Innovation is an independent, non-partisan think tank on international governance. Led by experienced practitioners and distinguished academics, CIGI supports research, forms networks, advances policy debate and generates ideas for multilateral governance improvements. Conducting an active agenda of research, events and publications, CIGI’s interdisciplinary work includes collaboration with policy, business and academic communities around the world.

CIGI’s current research programs focus on three themes: the global economy; global security & politics; and international law.

CIGI was founded in 2001 by Jim Balsillie, then co-CEO of Research In Motion (BlackBerry), and collaborates with and gratefully acknowledges support from a number of strategic partners, in particular the Government of Canada and the Government of Ontario.

Le CIGI a été fondé en 2001 par Jim Balsillie, qui était alors co-chef de la direction de Research In Motion (BlackBerry). Il collabore avec de nombreux partenaires stratégiques et exprime sa reconnaissance du soutien reçu de ceux-ci, notamment de l’appui reçu du gouvernement du Canada et de celui du gouvernement de l’Ontario.

For more information, please visit www.cigionline.org.

CIGI Masthead

Managing Editor, Publications: Carol Bonnett
Publications Editor: Jennifer Goyder
Publications Editor: Vivian Moser
Publications Editor: Patricia Holmes
Publications Editor: Nicole Langlois
Graphic Designer: Melodie Wakefield
Graphic Designer: Sara Moore

Executive

President: Rohinton Medhora
Vice President of Programs: David Dewitt
Vice President of Public Affairs: Fred Kuntz
Vice President of Finance: Mark Menard

Communications

Communications Manager: Tammy Bender
tbender@cigionline.org
(1 519 885 2444 x 7356)

Cover photo of Bayview Avenue, Toronto, July 8, 2013 by Roozbeh Rokni (Flickr Creative Commons).